Our Planet

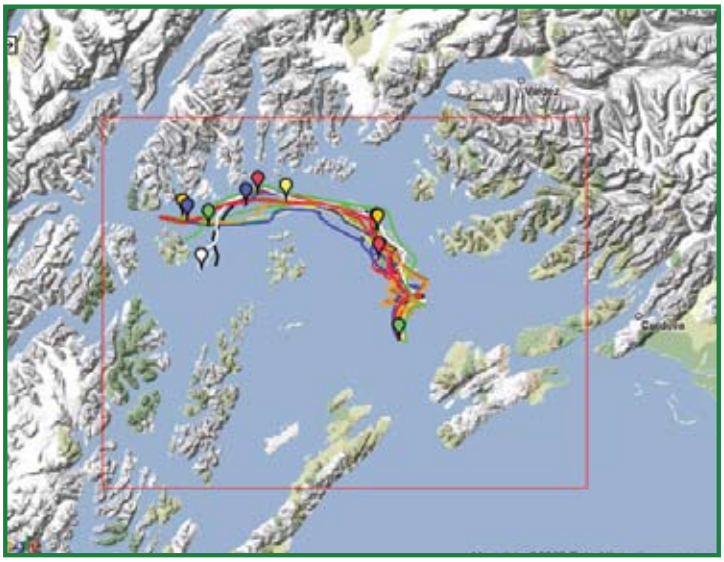
Using ROMS Ocean Model Ensembles to Predict Drifter Trajectories

To help with prediction of oil spill trajectories, NASA's Jet Propulsion Laboratory (JPL) supported the Prince William Sound (PWS) Field Experiment in July of this year. The JPL research team provided the field experiment with Regional Ocean Modeling System (ROMS) modeling forecasts that include real-time data assimilation. ROMS is a primitive-equation model using coastline- and terrain-following curvilinear coordinates.

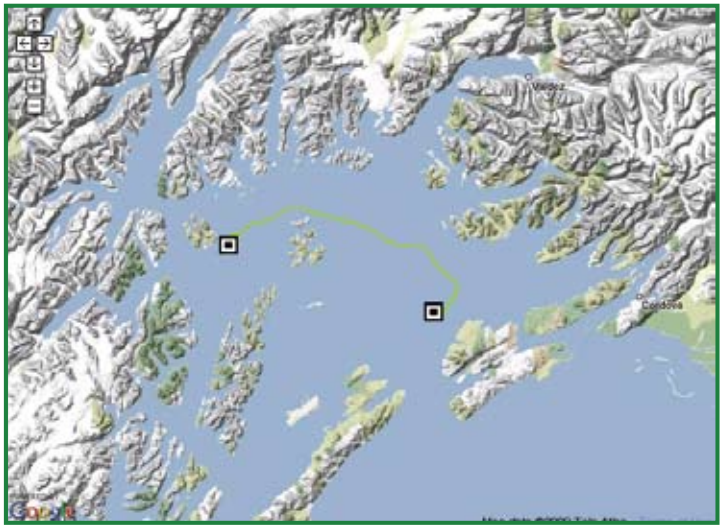
During the two-week PWS experiment, which ran from July 21 to August 2, 2009, buoys were released throughout the Sound to measure the speed and direction of surface currents, and to measure how well ROMS predicts ocean conditions. The experiment will be useful not only for prediction of oil spill trajectories, but will support Coast Guard Search and Rescue missions.

NASA researchers ran 16 ROMS forecast ensembles on JPL's Altix supercomputer each day. Each model in the ensemble contains slightly different initial conditions, taking about 30 minutes to generate 48-hour forecasts using 16 processors. Results were used to predict the spread of the buoy drifter trajectories, using an online tool located at the JPL OurOcean Portal, then uploaded in near-real time to the PWS website.

The PWS Field Experiment is organized by the Alaska Ocean Observing System, which is the umbrella regional association for three Alaska regional observing networks.



An iso-surface of the axial velocity backflow (-5 ft/sec), colored by pressure that shows a reverse flow from the inducer extending in a distinctive rotating pattern to locations upstream of the flowliner.



Observed drifter trajectory that is used to validate the ocean model forecast as displayed in top image.

http://ourocean.jpl.nasa.gov/
http://www.aoos.org/fieldexp/index.html

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